



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,744	11/26/2003	Donald L. Yates	M4065.0530/P530-A	3947

24998 7590 12/22/2005

DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP  
2101 L Street, NW  
Washington, DC 20037

EXAMINER
----------

LE, DUNG ANH

ART UNIT	PAPER NUMBER
----------	--------------

2818

DATE MAILED: 12/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/721,744

Applicant(s)

YATES ET AL.

Examiner

DUNG A. LE

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 29-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 29-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/18/2005 has been entered.

Claims 29, 31- 33, 38- 39, 41 and 43-48 have been amended. Claims 29-48 are pending in this examination.

### *Specification*

The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### *Claim Objections*

Claim 45 is objected to because of the following informality:

In claim 45, the limitation in lines 1-2 on the page 6 is similar to the limitation of last two lines on page 5.

**Claim Rejections**

***Claim Rejections - 35 USC § 112***

**Claim 41 is rejected** under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant introduces the new matter by adding :

“a free ferromagnetic layer” into claim 41.

The added matter(s) is(are) not supported in the Specification and it (they) (is) are not satisfactory resolved and consequently raise doubt as to possession of the claimed invention at the time of filing.

**Set of claims 29-40, 42- 44**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application

filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 29-40, 42- 44 are rejected under 35 U.S.C. 102(e) as being anticipated by Yates et al. (6,743,641).**

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

**Regarding claim 29,** Yated et al. teaches a magnetic random access memory cell (refer to figs. 13-22 and related texts) said memory cell comprising:

- a first magnetic layer 79 over a conductive layer 62;
- a nonmagnetic tunnel barrier layer 80 over said first magnetic layer; and
- a second magnetic layer over said nonmagnetic tunnel barrier layer 80, said second magnetic layer comprising a plurality of films 81/83, and a chemical mechanical polishing stop 85 (col 6, lines 50- 60, col 7, lines 40- 50).

**Regarding claim 30,** wherein said first magnetic layer 79 is a pinned layer (col 5, line 65).

**Regarding claim 31,** wherein said first magnetic player 79 is arranged and configured to provide a ferromagnetic pinned layer (col 6, lines 5- 10).

**Regarding claim 32,** wherein said second magnetic layer 81/83 is includes a sense layer.

**Regarding claim 33,** wherein said sense layer 81/83 is arranged and configured to product provide a ferromagnetic sense layer .

**Regarding claim 34,** wherein said nonmagnetic tunnel barrier layer comprises aluminum oxide (col 5, line 21).

**Regarding claim 35,** wherein said aluminum oxide has a thickness of about 5 to 25 Angstroms (col 5, line 23).

**Regarding claim 36,** wherein said nonmagnetic tunnel barrier layer comprises a material selected from the group consisting of copper, titanium oxide, magnesium oxide, silicon oxide and aluminum nitride (col 5, lines 25- 30).

**Regarding claim 37**, wherein said conductive layer 62 is selected from the group consisting of copper, aluminum, tungsten and gold (col 4, lines 65- 67 and col 5, lines 1-3).

**Regarding claim 38**, wherein said first magnetic layer comprises a first tantalum layer, a first nickel-iron layer 73, a manganese-iron layer 75 , and a second nickel-iron layer 77 (col 6, lines 6-15).

**Regarding claim 39**, wherein said second plurality of films comprises a third nickel-iron layer 81, a second tantalum layer 83, and a tungsten nitrogen chemical mechanical polishing stop 85 (col 6, lines 30- 50).

**Regarding claim 40**, wherein said memory cell is coupled to at least one word line 93/99.

**Regarding claim 42**, processor system comprising at least one memory circuit, wherein said at least one memory circuit comprises at least one memory cell (fig. 22, lines 15-20)

**Regarding claim 43**, wherein said chemical mechanical polishing stop layer 85 comprises at least one of tungsten nitrogen, tantalum nitrogen, tungsten silicon nitrogen, and amorphous carbon. (col 6, line 55)

**Regarding claim 44**, wherein said chemical mechanical polishing stop layer 85 is an oxide (col 6, lines 55- 60).

**Set of claims 45- 48**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 45- 46 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee (6780652).**

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.



Lee teaches a magnetic random access memory cell, said memory cell comprising:  
a first magnetic layer 79 adjacent a conductive layer 63, said first magnetic layer comprising a first plurality of films;

a nonmagnetic tunnel barrier layer 80 separated from said conductive layer by said first magnetic layer; and

a second magnetic layer separated from said first magnetic layer 79 by said nonmagnetic tunnel barrier layer 80, said second magnetic layer comprising a second plurality of films including a ferromagnetic material 81 adjacent said nonmagnetic tunnel barrier layer 80, a tantalum film 83 (col 5, line 50) adjacent said ferromagnetic material 81, and;

a chemical mechanical polishing stop layer 85 arranged to protect said second magnetic layer.

**Regarding claim 46**, wherein said chemical mechanical polishing stop layer 85 comprises at least one of tungsten nitrogen, tantalum nitrogen (col 6, line 63), tungsten silicon nitrogen, and amorphous carbon.

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 47- 48 are rejected under 35 U.S.C. 103(a) as being obvious over Lee (6780652 B2) in view of Yates et al. (6743641 B2).**

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention “by another”; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the

reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Lee teaches the claimed invention as applied to claim 45 except for mechanical polishing stop layer is an oxide and chemical mechanical polishing stop layer is a nitride.

Yates et al. teach mechanical polishing stop layer is an oxide and chemical mechanical polishing stop layer is a nitride ( col 6, lines 55-60).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form mechanical polishing stop layer is an oxide and chemical mechanical polishing stop layer is a nitride in Lee 's method, in order to obtain the best result in protecting the underlying layers during the polishing process.

When responding to the office action, Applicants' are advice to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.


A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung A. Le whose telephone number is (571) 272-1784. The examiner can normally be reached on Monday-Tuesday and Thursday 6:00am- 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The central fax phone numbers for the organization where this application or proceeding is assigned are (571)272-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DUNG A. LE   
Primary Examiner  
Art Unit 2818